

CLASS 7
MATHEMATICS
CHAPTER: ALGEBRAIC EXPRESSIONS

1. (i) If $z = 10$, find the value of $z^3 - 3(z - 10)$.

Solution:-

From the question it is given that $z = 10$

We have,

$$= z^3 - 3z + 30$$

Then, substitute the value of z in the equation

$$= (10)^3 - (3 \times 10) + 30$$

$$= 1000 - 30 + 30$$

$$= 1000$$

(ii) If $p = -10$, find the value of $p^2 - 2p - 100$

Solution:-

From the question it is given that $p = -10$

We have,

$$= p^2 - 2p - 100$$

Then, substitute the value of p in the equation

$$= (-10)^2 - (2 \times (-10)) - 100$$

$$= 100 + 20 - 100$$

$$= 20$$

2. What should be the value of a if the value of $2x^2 + x - a$ equals to 5, when $x = 0$?

Solution:-

From the question it is given that $x = 0$

We have,

$$2x^2 + x - a = 5$$

$$a = 2x^2 + x - 5$$

Then, substitute the value of x in the equation

$$a = (2 \times 02) + 0 - 5$$

$$a = 0 + 0 - 5$$

$$a = -5$$

CLASS 6
SCIENCE
AIR AROUND US

INTRODUCTION:

We all know that all living things require air. But, have you ever seen air? You might not have seen air, but, surely you must have felt its presence in so many ways.

Why air is important?

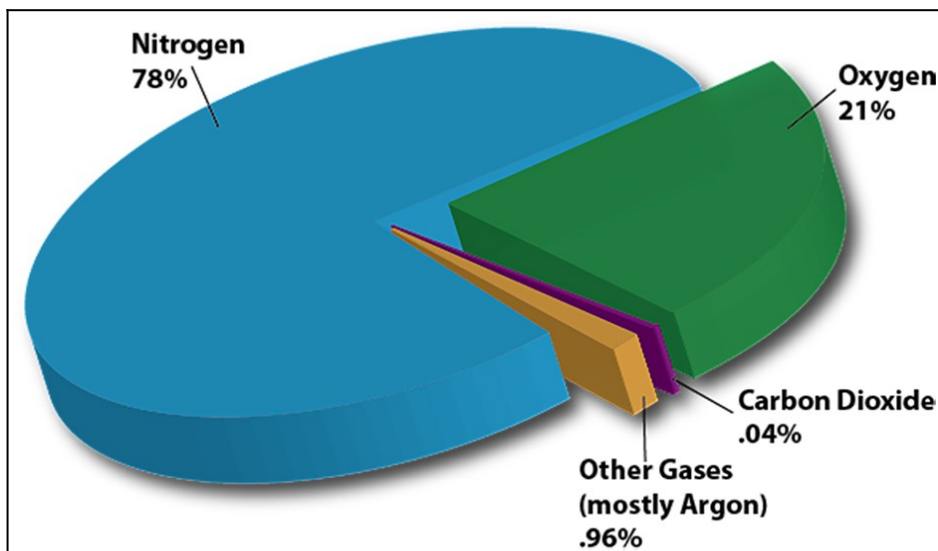
Air is vital for life. Oxygen in air fuels our cells, enabling respiration. It supports combustion, providing heat and energy. Plants use air for photosynthesis, releasing oxygen and sustaining life. Air circulation patterns regulate weather and climate, maintaining environmental balance.

We need air for several crucial reasons. Firstly, oxygen, a vital component of air, is essential for the process of respiration in humans and many other living organisms. **Without oxygen, our cells would be unable to produce the energy needed for survival.**

Composition of air:

- Nitrogen (N₂): Approximately 78%
- Oxygen (O₂): Approximately 21%
- Argon (Ar): Approximately 0.93%
- Carbon Dioxide (CO₂): Approximately 0.04%
- Other gases: Including trace amounts of neon, helium, methane, krypton, hydrogen, xenon, and ozone, among others.

Water vapor is also present in variable amounts, depending on factors such as temperature and humidity. This composition may vary slightly depending on location, altitude, and environmental factors.



Nitrogen, comprising approximately 78% of the air, plays a vital role in various biological processes, including protein synthesis in living organisms and maintaining atmospheric pressure, crucial for supporting life on Earth.

Oxygen in air is vital for sustaining life, as it is essential for respiration in humans and many other organisms, enabling the production of energy needed for survival. Additionally, oxygen supports combustion processes, providing heat and energy for various human activities.

Argon, though a minor component of air, plays a crucial role in various applications, including shielding gas in welding and as a protective atmosphere in industries like metallurgy. Additionally, it contributes to the stability of Earth's atmosphere and helps regulate temperature by participating in the greenhouse effect.

Carbon dioxide (CO₂) is crucial in air composition as it plays a vital role in photosynthesis, enabling plants to produce oxygen and sustain life on Earth, while also contributing to the greenhouse effect, regulating the planet's temperature.

Water vapor in air plays a crucial role in regulating humidity levels, influencing weather patterns, and facilitating the water cycle by condensing to form clouds and precipitation. Additionally, it contributes to the greenhouse effect, helping to maintain Earth's temperature and climate.